

GENERATOR

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MEMORANDUM FOR THE RECORD

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SUBJECT: Visit to [ ] on Portable Hydrogen Generator

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1. On 11 February 1958 the undersigned met with [ ]

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[ ] for the purpose of reviewing progress on the portable hydrogen generator.

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2. A total of seven tests had been run on the 1/5 scale unit, four of them being 1/5 scale tests (using about 20 pounds of sodium borohydride, 110 gallons of water, and 830 grams of cobaltous chloride) and three being 1/10 scale tests. Most of the tests were run at a pool temperature of about 60°F. The average temperature rise during generation was approximately 60°F. Total generation time varied from 60 minutes to 150 minutes with the average being about 85 minutes. The long generation time of 150 minutes resulted from a low initial temperature of 43°F. The faster rates were usually due to higher concentrations of borohydride. Approximately 20% by volume of the off gas was water vapor on the runs having an initial pool temperature of 60°F. Much of this water vapor would condense and run out of the balloon during inflation. However since as much as 2 pound moles of water vapor (36 pounds) could be introduced into the balloon during inflation, there might be a problem of weight pickup on the polyethylene film. This might be particularly serious after launch when the balloon would get into lower temperatures which would cause further condensation and perhaps freezing. [ ] was asked to look into the problem and said that they would.

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3. [ ] will attempt to reduce the total generation time to about 45 mintues. This will probably be done by using a higher concentration of both the borohydride and the catalyst.

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4. Design of the full scale generator came up for discussion. The zipper seals on the present unit are unsatisfactory and will be replaced by some means of bunching the fabric at the openings and tying it off with cord. [ ] had intended to build the generator as a one piece unit. The weight however would be 75 pounds and the size about 15 cubic feet in its collapsed condition. The weight and bulk would make for a very difficult "man-portable" situation and therefore Battelle will have the unit made in two pieces. It should be recognized that the bulk of the chemicals is also considerable -- 100 pounds of sodium borohydride filling completely a 55 gallon drum. Transporting and caching of such of bulk may present real problems to the operator who will have a balloon in addition to the generator and chemicals to concern himself with.

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5. [ ] estimates that the first full scale test will be run in July.

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